US007555660B2

(12) **United States Patent**
Kamisuwa et al.

(10) **Patent No.: US 7,555,660 B2**
(45) **Date of Patent: Jun. 30, 2009**

(54) **ELECTRIC-POWER MANAGEMENT OF AT LEAST ONE IMAGE FORMING APPARATUS TO CONTROL POWER CONSUMPTION OF A BUILDING**

(75) Inventors: **Yoshikatsu Kamisuwa**, Tokyo (JP); **Rintaro Nakane**, Yokohama (JP)

(73) Assignees: **Kabushiki Kaisha Toshiba**, Tokyo (JP); **Toshiba Tec Kabushiki Kaisha**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 492 days.

(21) Appl. No.: **11/421,436**

(22) Filed: **May 31, 2006**

(65) **Prior Publication Data**

US 2007/0280708 A1 Dec. 6, 2007

(51) **Int. Cl.**
G06F 1/26 (2006.01)

(52) **U.S. Cl.** **713/300**; 700/295; 713/320

(58) **Field of Classification Search** 358/1.14; 700/295; 713/300, 320, 340
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,265,852	B2 *	9/2007	Goto et al.	358/1.14
7,460,930	B1 *	12/2008	Howell et al.	700/295
2001/0010032	A1 *	7/2001	Ehlers et al.	702/62

FOREIGN PATENT DOCUMENTS

JP	2002-292973	10/2002

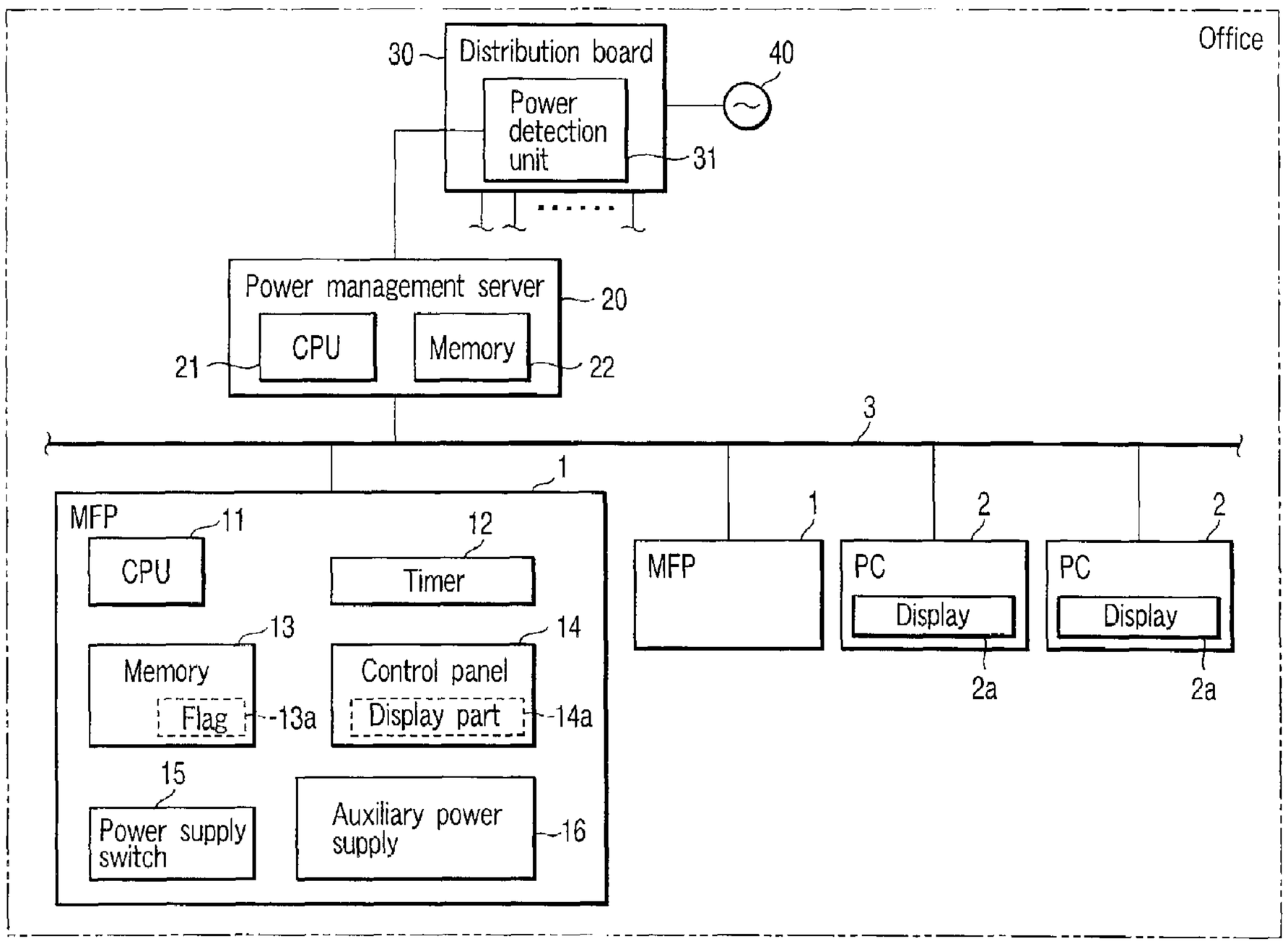
* cited by examiner

Primary Examiner—Chun Cao
Assistant Examiner—Albert Wang
(74) *Attorney, Agent, or Firm*—SoCal IP Law Group LLP; Steven C. Sereboff; John E. Gunther

(57) **ABSTRACT**

Power consumption P of a building where plural image forming apparatuses **1** are installed is detected. When this detection result reaches an upper limit value Pa, power consumption of each of the image forming apparatuses **1** is reduced.

18 Claims, 6 Drawing Sheets



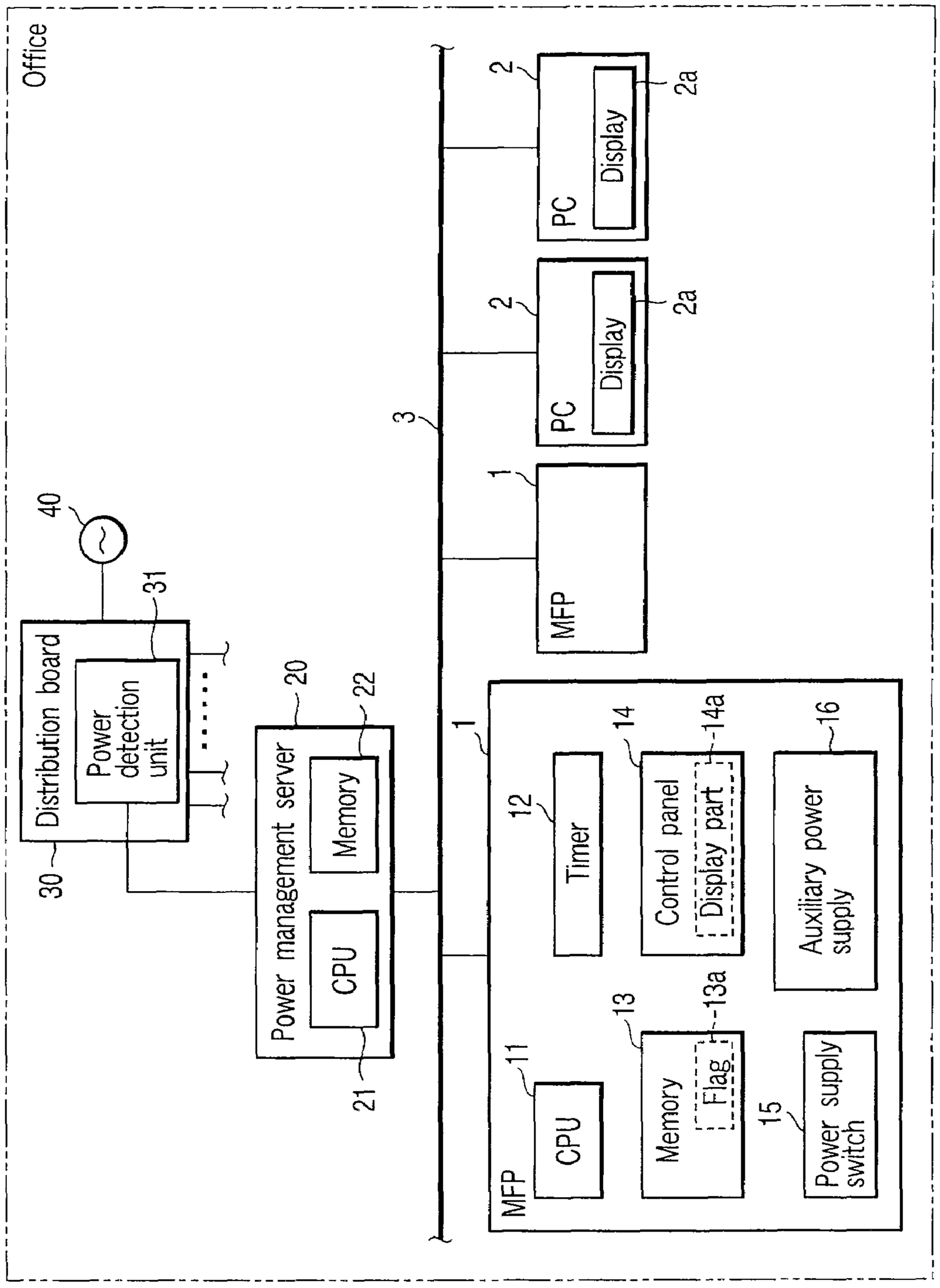

Office
2
2a
PC
Display
2
2a
PC
Display
3
1
MFP
40
31
Distribution board
Power detection unit
30
20
22
Power management server
Memory
CPU
21
1
12
Timer
14
Control panel
Display part
14a
16
Auxiliary power supply
MFP
11
CPU
13
Memory
Flag
13a
15
Power supply switch

FIG. 1

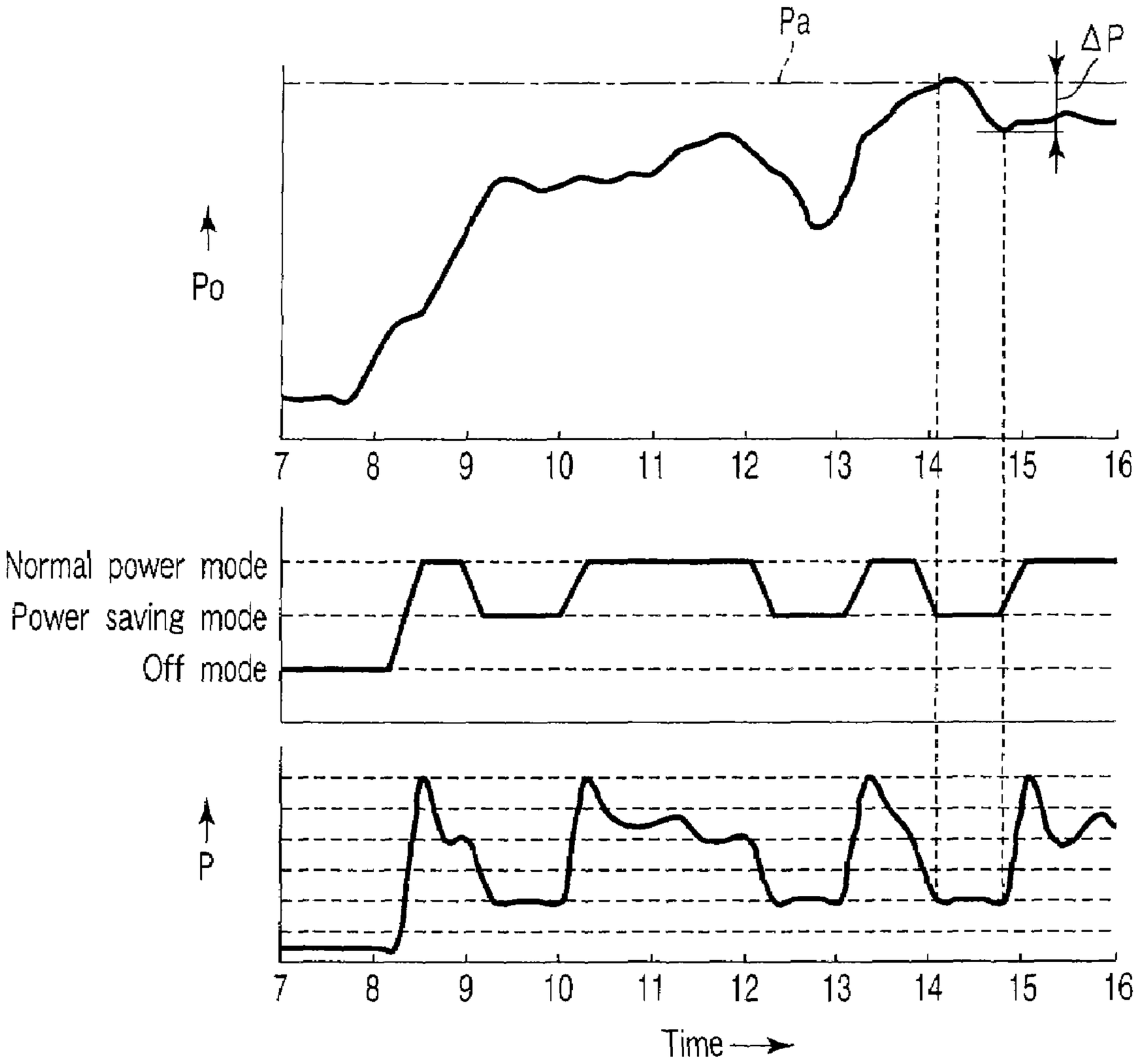

Pa
ΔP
Po
7
8
9
10
11
12
13
14
15
16
Normal power mode
Power saving mode
Off mode
P
7
8
9
10
11
12
13
14
15
16
Time

FIG. 2

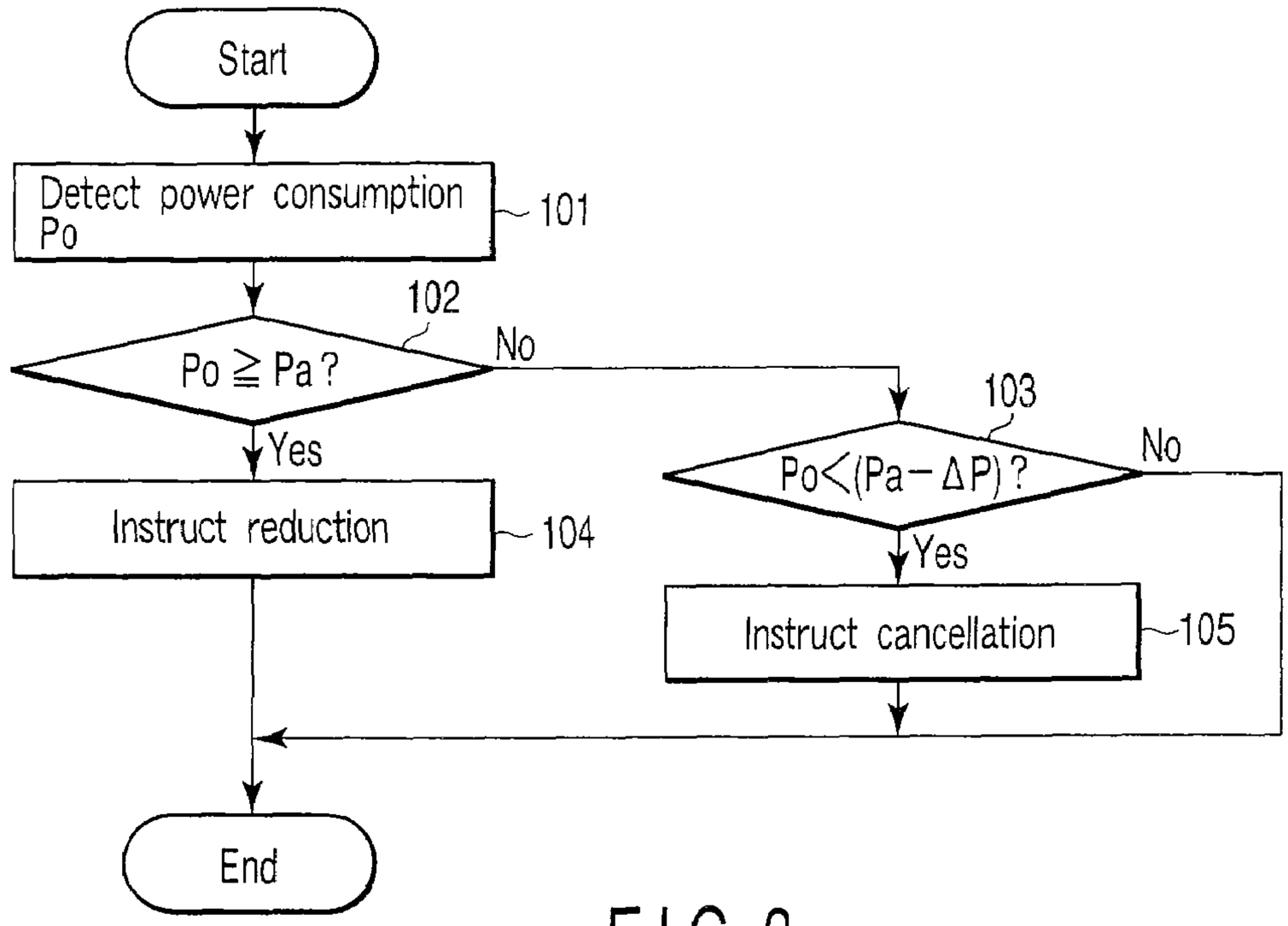

Start
Detect power consumption Po
101
102
Po ≧ Pa ?
No
Yes
Instruct reduction
104
103
Po<(Pa−ΔP) ?
No
Yes
Instruct cancellation
105
End

FIG. 3

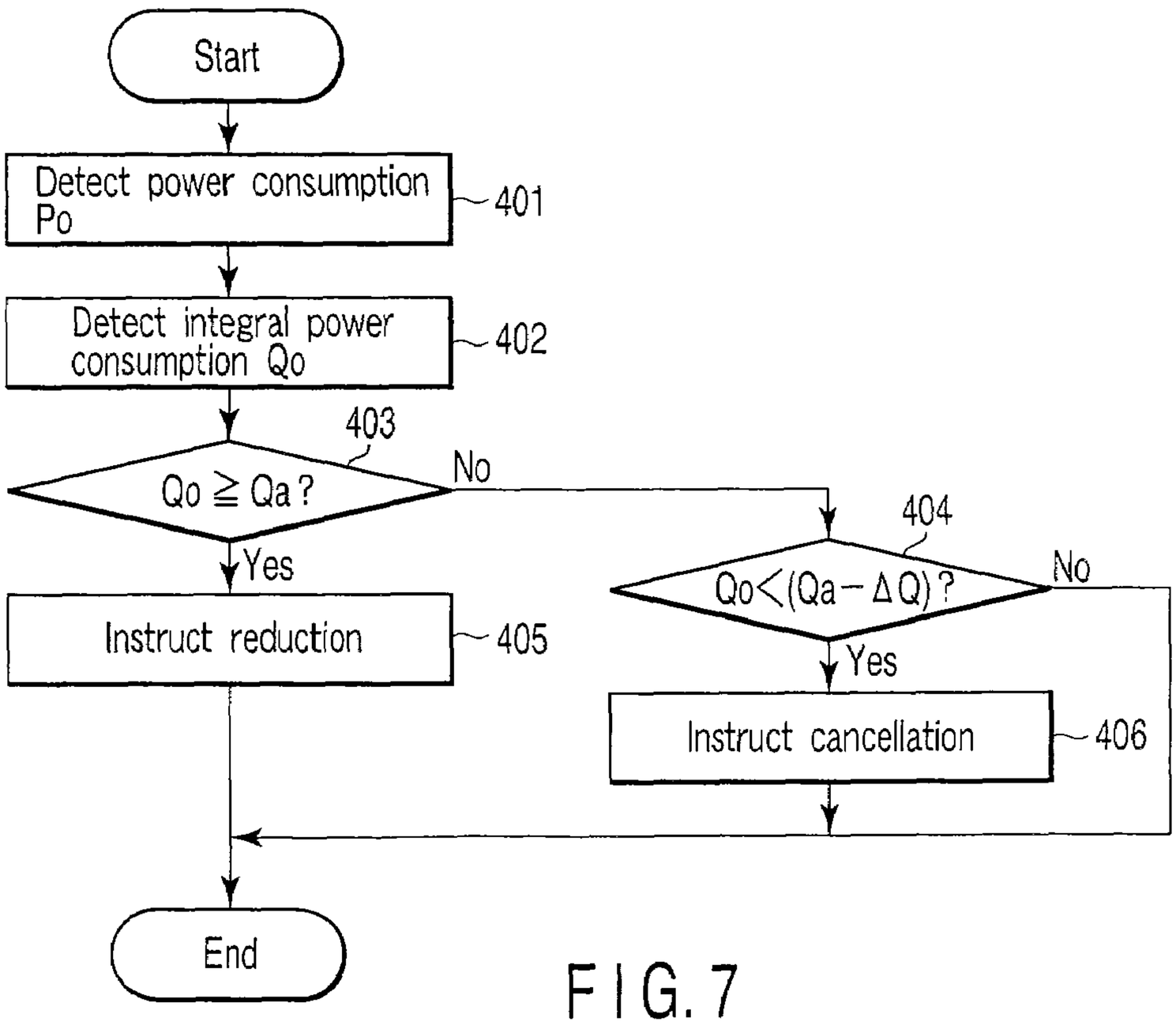

Start
Detect power consumption Po
401
Detect integral power consumption Qo
402
403
Qo ≧ Qa ?
No
Yes
Instruct reduction
405
404
Qo<(Qa−ΔQ) ?
No
Yes
Instruct cancellation
406
End

FIG. 7

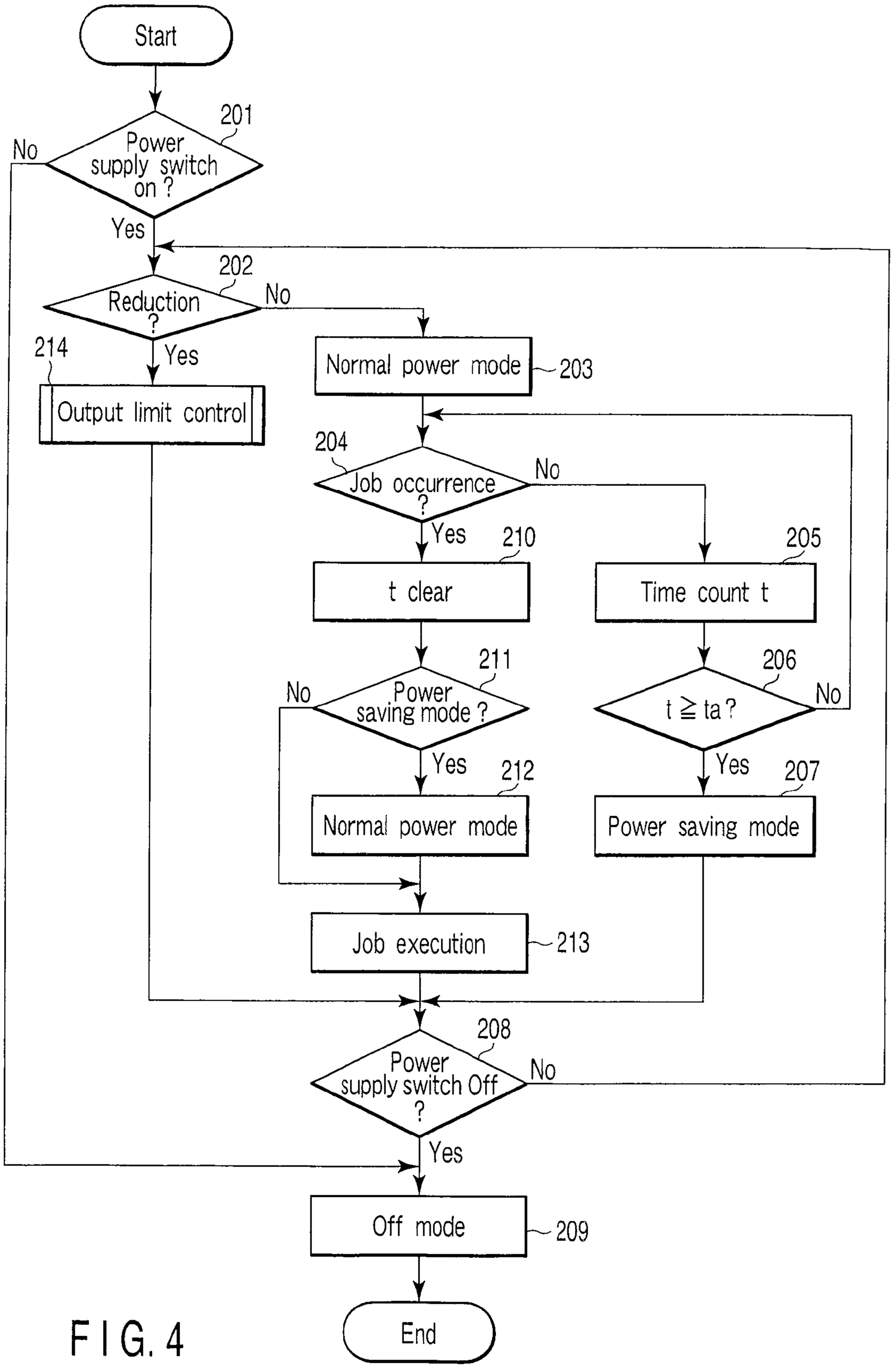

Start
201
Power supply switch on ?
No
Yes
202
Reduction ?
No
Yes
214
Output limit control
Normal power mode
203
204
Job occurrence ?
No
Yes
210
t clear
205
Time count t
211
Power saving mode ?
No
Yes
206
t ≧ ta ?
No
Yes
212
Normal power mode
207
Power saving mode
Job execution
213
208
Power supply switch Off ?
No
Yes
Off mode
209
End

FIG. 4

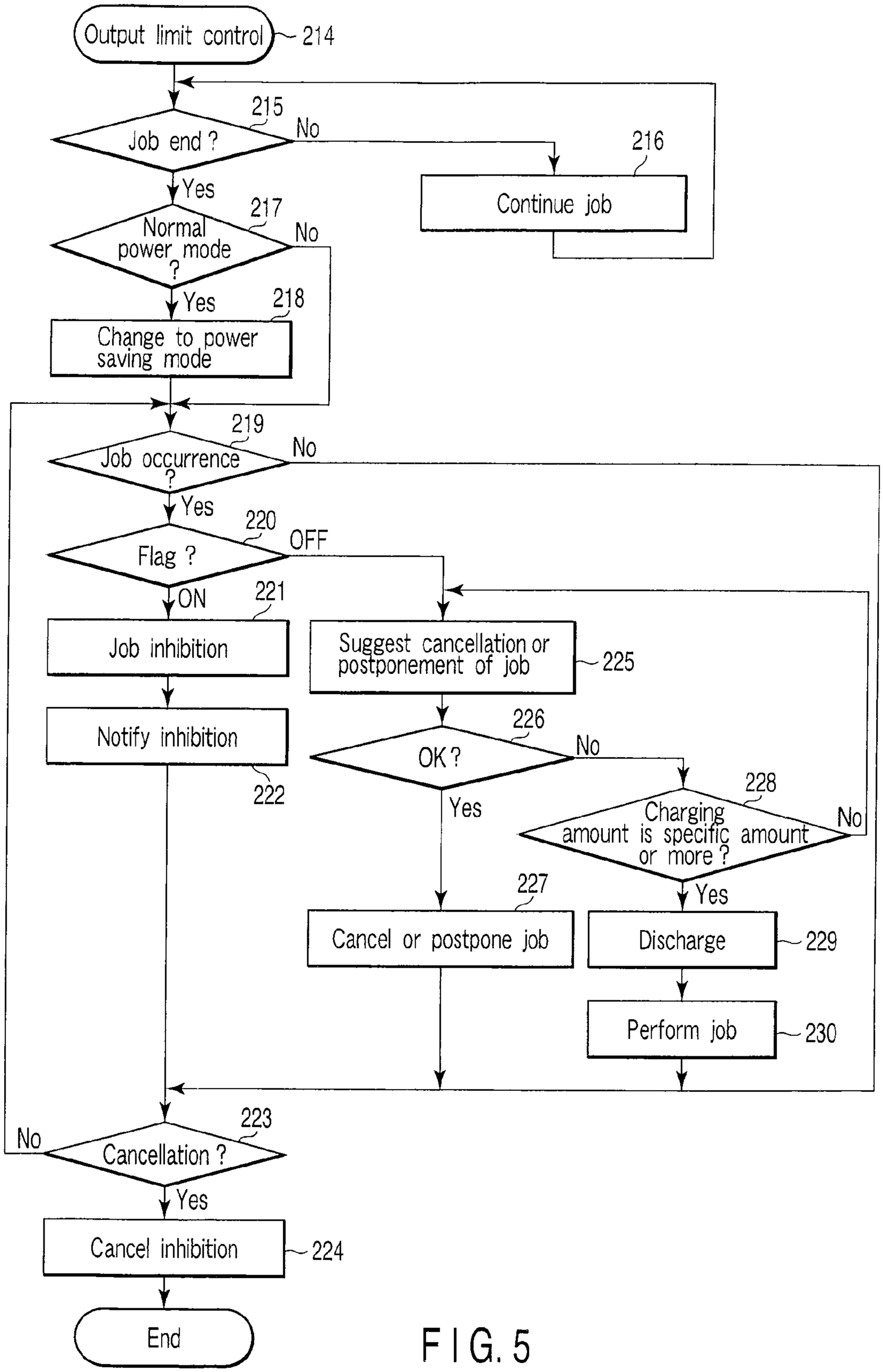

Output limit control
214
215
Job end ?
No
216
Continue job
Yes
217
Normal power mode ?
No
Yes
218
Change to power saving mode
219
Job occurrence ?
No
Yes
220
Flag ?
OFF
ON
221
Job inhibition
Notify inhibition
222
Suggest cancellation or postponement of job
225
226
OK ?
No
Yes
228
Charging amount is specific amount or more ?
No
Yes
227
Cancel or postpone job
Discharge
229
Perform job
230
223
No
Cancellation ?
Yes
Cancel inhibition
224
End

FIG. 5

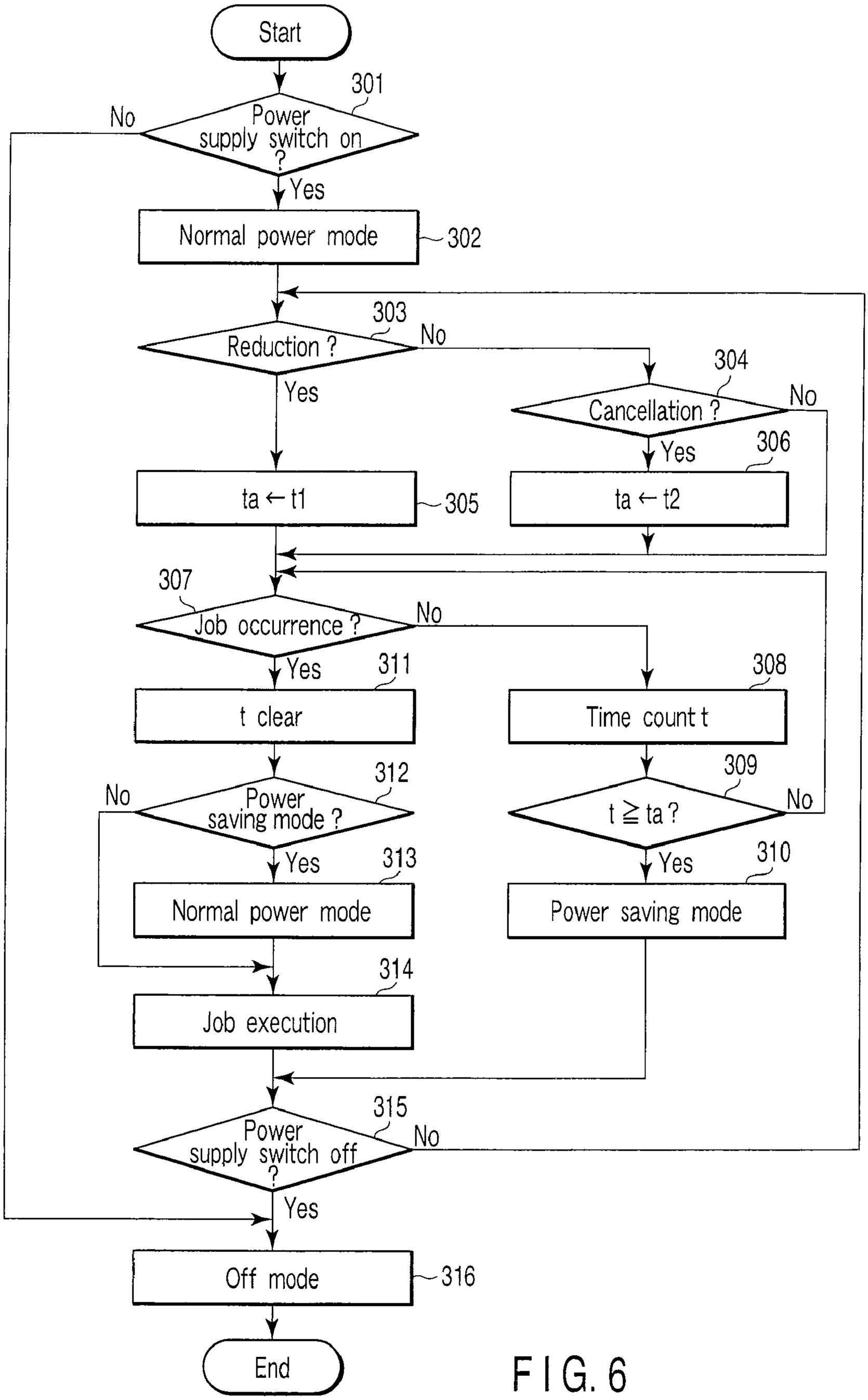

Start
301
Power supply switch on ?
No
Yes
Normal power mode
302
303
Reduction ?
No
Yes
304
Cancellation ?
No
Yes
306
ta ← t1
305
ta ← t2
307
Job occurrence ?
No
Yes
311
t clear
308
Time count t
312
Power saving mode ?
No
Yes
313
309
t ≧ ta ?
No
Yes
310
Normal power mode
Power saving mode
314
Job execution
315
Power supply switch off ?
No
Yes
Off mode
316
End

FIG. 6

ELECTRIC-POWER MANAGEMENT OF AT LEAST ONE IMAGE FORMING APPARATUS TO CONTROL POWER CONSUMPTION OF A BUILDING

BACKGROUND OF THE INVENTION

A composite image forming apparatus (called an MFP) having plural functions, such as a copy function, a scan function and a print function, can copy an image of a document. Besides, this MFP can print image data transmitted from a network-connected external equipment, for example, a personal computer.

The power consumption of a building, for example, an office where such MFPs and personal computers are installed is very large. When the power consumption exceeds a rated value, a breaker of the office operates, and the supply of electric power to the MFPs and the personal computers is stopped.

BRIEF SUMMARY OF THE INVENTION

An object of an aspect of the invention is to provide an electric-power management system and a control method thereof in which the power consumption of a building where an image forming apparatus is installed can be limited to a previously determined upper limit value or less.

An electric-power management system according to an aspect of the invention includes

at least one image forming apparatus,

a power detection unit that detects one of power consumption and integral power consumption of a building where the image forming apparatus is installed, and

a power management server that reduces power consumption of the image forming apparatus in a case where a detection result of the power detection unit reaches a previously determined upper limit value.

Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

FIG. **1** is a view showing a structure in respective embodiments.

FIG. **2** is a view showing a change in power consumption and a change in operation mode in the respective embodiments.

FIG. **3** is a flowchart for explaining the operation of a power detection unit and a power management server in a first and a second embodiments.

FIG. **4** is a flowchart for explaining the operation of an image forming apparatus in the respective embodiments.

FIG. **5** is a flowchart showing an output limit control routine in FIG. **4**.

FIG. **6** is a flowchart for explaining the operation of the second embodiment.

FIG. **7** is a flowchart for explaining the operation of a power detection unit and a power management server in a third embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[1] Hereinafter, a first embodiment of the invention will be described with reference to the drawings.

As shown in FIG. **1**, plural image forming apparatuses (called MFPs) **1** and plural personal computers **2** are installed in an office in a building. These image forming apparatuses **1** and the personal computers **2** are connected to a power management server **20** through a network (for example, LAN) **3**.

Each of the image forming apparatuses **1** is of a composite type having plural functions such as a copy function, a scan function and a print function, and includes a CPU **11**, a timer **12**, a memory **13**, a control panel **14**, a power supply switch **15**, and an auxiliary power supply **16**. These image forming apparatuses **1** can copy images of documents, and can print image data sent from the respective personal computers **2** through the network **3**. The auxiliary power supply **16** is charged by a power supply circuit of the image forming apparatus **1**, and can output the charged power as auxiliary power for the operation of the image forming apparatus **1**.

Each of the personal computers **2** has a function to send image data prepared by a built-in operation program to one of the image forming apparatuses **1** and includes a display **2***a*.

The power management server **20** is connected through a signal line to a power detection unit **31** of a distribution board **30**. The distribution board **30** is connected to a commercial AC power supply **40**.

The distribution board **30** supplies AC voltage of the commercial AC power supply **40** to respective equipments in the office. The power detection unit **31** detects power consumption (total power consumption of the respective equipments) Po of the office. This detection result is supplied to the power management server **20**.

The power management server **20** is for reducing power consumption P of each of the image forming apparatuses **1** in a case where the detection result Po of the power detection unit **31** reaches a previously determined upper limit value Pa, and includes a CPU **21** and a memory **22**.

The CPU **21** has following (1) and (2) as main functions.

(1) A judgment section that judges whether or not the detection Po of the power detection unit **31** is the previously determined upper limit value Pa or higher, and whether or not the detection result Po of the power detection unit **31** is less than a specified value (=Pa−ΔP) lower than the upper limit value Pa by ΔP. The upper limit value Pa is stored in the memory **22**.

(2) An instruction section that instructs each of the image forming apparatuses **1** to reduce the power in a case where the judgment result is the upper limit value Pa or higher and instructs each of the image forming apparatuses **1** to cancel the reduction in a case where the judgment result is less than the specified value (=Pa−ΔP).

Each of the image forming apparatuses **1** has a function to perform plural jobs, and has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption.

Besides, the CPU **11** of the image forming apparatus **1** has following (11) to (15) as main functions.

(11) A first control section that changes the operation mode from the normal power mode to the power saving mode in a

case where a time of the standby reaches a previously determined set time ta. The set time ta is stored in the memory **13**.

(12) A second control section that continues, in a case where the image forming apparatus **1** is performing an operation (job is being performed) when a reduction instruction is received from the power management server **20**, the operation, and changes the operation mode from the normal power mode to the power saving mode after the operation is ended.

(13) A third control section that inhibits, when inhibition is set by a flag **13***a* in the memory **13** at a time of occurrence of a job, execution of the job and notifies the inhibition by a display. The flag **13***a* is for setting the inhibition of the job, and one of "on" and "off" is set according to an operation of the control panel **14**. The "on" represents "inhibition", and the "off" represents "not inhibited". Incidentally, the display is performed on a display part **14***a* of the control panel **14** in the case of copying, and the display is performed on the display **2***a* of the personal computer **2** in the case of printing based on the transmission of image data from the personal computer **2**.

(14) A fourth control section that suggests, when the inhibition is not set by the flag **13***a* at the time of occurrence of the job, cancellation or postponement of the job by a display. Incidentally, the display is performed by the display part **14***a* of the control panel **14** in the case of copying, and the display is performed by the display **2***a* of the personal computer **2** in the case of printing based on the transmission of image data from the personal computer **2**.

(15) A fifth control section that performs, in a case where execution of the job is requested by an operation of the control panel **14** in spite of the suggestion, the job under a condition that the charging amount of the auxiliary power supply **16** is a specific amount or more and by using the power (discharge power) of the auxiliary power supply **16**.

The operation will be described.

FIG. **2** shows an example of a change in the power consumption P of the image forming apparatus **1** from morning to evening, a change in the power consumption Po of the office, and a change in the operation mode (normal power mode, power saving mode, off mode) of the image forming apparatus **1**. The off mode is also called a FAX mode, and in the case where the power supply switch **15** is off, only the FAX function of the image forming apparatus **1** is made to operate.

The operation of the power detection unit **31** and the power management server **20** is shown in a flowchart of FIG. **3**, and the operation of each of the image forming apparatuses **1** is shown in flowcharts of FIG. **4** and FIG. **5**.

First, the power consumption P of the office is detected by the power detection unit **31** (YES at step **101**). This detection result is supplied to the power management server **20**.

In the power management server **20**, it is judged whether or not the detection result P of the power detection unit **31** is the previously determined upper limit value Pa or more (step **102**), and it is judged whether or not the detection result P of the power detection unit **31** is less than the specified value (=Pa−ΔP) lower than the upper limit value Pa by ΔP (step **103**).

In the case where the detection result P is the upper limit value Pa or more (YES at step **102**), each of the image forming apparatuses **1** is instructed to reduce the power (step **104**). In the case where the detection result P is less than the specified value (=Pa−ΔP) (YES at step **103**), each of the image forming apparatuses **1** is instructed to cancel the reduction (step **105**).

In each of the image forming apparatuses **1**, when the power supply switch **15** is turned on (YES at step **201**), it is judged whether or not the reduction instruction is received from the power management server **20** (step **202**). Unless the reduction instruction is received (NO at step **202**), the normal power mode is set (step **203**). Then, the occurrence of a job is monitored (step **204**).

When there is no occurrence of the job (NO at step **204**), a time count t by the timer **12** is performed (step **205**). This time count t and a set time ta are compared with each other (step **206**). When the time count t reaches the set time ta (YES at step **206**), the normal power mode is changed to the power saving mode (step **207**).

While the time count t does not reach the set time ta (NO at step **206**), when some job occurs (YES at step **204**), the time count t is cleared (step **210**), and it is judged whether or not the power saving mode is set (step **211**). When the power saving mode is set (YES at step **211**), the power saving mode is changed to the normal power mode (step **212**). Then, the job is performed (step **213**).

When the power supply switch **15** is turned off (YES at step **208**), the off mode is set (step **209**).

On the other hand, the power consumption Po of the office reaches a peak in the daytime when the operating ratio of air conditioners and the like is high. In the example of FIG. **2**, the power consumption Po reaches the upper limit value Pa at 2 pm or later. At this time, the power management server **20** instructs each of the image forming apparatuses **1** to reduce the power.

When the reduction instruction is received from the power management server **20** (NO at step **202**), an output limit control is performed in each of the image forming apparatuses **1** (step **214**). The output limit control is shown in a flowchart of FIG. **5**.

That is, when the reduction instruction is received, in case the image forming apparatus **1** is performing some job (NO at step **215**), the job is continued (step **216**). When the job is ended (YES at step **215**), the operation mode is judged (step **217**). When the mode is the normal power mode (YES at step **217**), it is changed to the power saving mode (step **218**). When the mode is the power saving mode (NO at step **217**), the power saving mode is kept as it is.

Since the normal power mode is kept during the execution of the job, the job can be certainly completed.

After the mode is changed to the power saving mode, when some job occurs (YES at step **219**), the flag **13***a* in the memory **13** is confirmed (step **220**). When the flag **13***a* is "on" (YES at step **220**), it is judged that the inhibition is set, and the generated job is inhibited (step **221**). With this inhibition, the inhibition is notified by a display (step **222**). That is, when the job is the copying, the guiding sentence of the copy inhibition is displayed on the display part **14***a* of the control panel **14** of the image forming apparatus **1**. When the job is the printing based on the transmission of image data from the personal computer **2**, the guiding sentence of the copy inhibition is displayed on the display **2***a* of the personal computer **2**.

As stated above, the power saving mode is set, and the job is inhibited, so that the power consumption P of the image forming apparatus **1** is reduced. Consequently, a rise in the power consumption Po of the office can be suppressed.

At the time of occurrence of the job (YES at step **219**), when the flag **13***a* is "off" (NO at step **220**), it is judged that the inhibition is not set, and the cancellation or postponement of the job is suggested by a display (step **225**). That is, when the job is the copying, a guiding sentence to suggest the cancellation or postponement of the copying is displayed on the display part **14***a* of the control panel **14** of the image forming apparatus **1**. When the job is the printing based on the transmission of image data from the personal computer **2**, a

guiding sentence to suggest the cancellation or postponement of the copying is displayed on the display **2***a* of the personal computer **2**.

When, for example, a clear button of the control panel **14** is turned on in accordance with this suggestion, that is, when it is OK (YES at step **226**), the job is cancelled or postponed (step **227**).

However, when, for example, a start button of the control panel **14** is turned on, it is judged that the execution of the job is requested (NO at step **226**), and it is judged whether or not the charging amount of the auxiliary power supply **16** is a specific amount or more (step **228**). When the charging amount is the specific amount or more (YES at step **228**), the auxiliary power supply **16** is discharged (step **229**). This discharge power is used as the auxiliary power and the job is performed (step **230**).

As stated above, even in the power saving mode, in the case where the job is required at any price, the job can be performed by using the discharge of the auxiliary power supply **16**.

When the power consumption Po of the office is lowered to a value less than the specified value (=Pa−ΔP), the power management server **20** instructs each of the image forming apparatuses **1** to cancel the reduction.

When the cancellation instruction is received from the power management server **20** (YES at step **223**), each of the image forming apparatuses **1** cancels the inhibition of the job (step **224**).

By the above control, the power consumption Po of the building where the respective image forming apparatuses **1** and the respective personal computers **2** are installed is limited to the upper limit value Pa or less. By this, the actuation of a breaker of the office can be prevented, and an unnecessary stop of the respective image forming apparatuses **1** and the respective personal computers **2** can be avoided.

[2] A second embodiment will be described with reference to a flowchart of FIG. **6**.

The CPU **11** of each of the image forming apparatuses **1** has following (31) and (32) as main functions.

(31) A first control section that changes an operation mode from a normal power mode to a power saving mode in a case where a standby time reaches a previously determined set time ta. The set time ta is stored in the memory **13**.

(32) A second control section that changes the set time ta to a time shorter than normal in a case where a reduction instruction is received.

In each of the image forming apparatuses **1**, when the power supply switch **15** is turned on (YES at step **301**), the normal power mode is set (step **302**). Then, it is judged whether or not the reduction instruction or cancellation instruction is received from the power management server **20** (step **303**, **304**). When the reduction instruction is received (YES at step **303**), t**1** shorter than normal is set as the set time ta (step **305**). When the cancellation instruction is received (YES at step **304**), a normal time t**2** (>t**1**) is set as the set time ta (step **306**). Then, the occurrence of a job is monitored (step **307**).

When there is no occurrence of the job (NO at step **307**), a time count t by the timer **12** is performed (step **308**). When the time count t reaches the set time ta (YES at step **309**), the normal power mode is changed to the power saving mode (step **310**).

While the time count t does not reach the set time ta (NO at step **309**), when some job occurs (YES at step **307**), the time count t is cleared (step **311**), and it is judged whether or not the power saving mode is set (step **312**). When the power saving mode is set (YES at step **312**), the power saving mode is changed to the normal power mode (step **313**). Then, the job is performed (step **314**).

When the power supply switch **15** is turned off (YES at step **315**), the off mode is set (step **316**).

Incidentally, in the case where the reduction instruction is received from the power management server **20**, an output limit control similar to that of the first embodiment may be performed.

As described above, in the case where the power consumption Po of the office reaches the upper limit value Pa, the time ta in which the normal power mode shifts to the power saving mode is changed to t**1** shorter than the normal time t**2**, so that the power consumption Po of the building where the respective image forming apparatuses **1** and the respective personal computers **2** are installed is limited to the upper limit value Pa or less. By this, the actuation of a breaker of the office can be prevented, and an unnecessary stop of the respective image forming apparatuses **1** and the respective personal computers **2** can be avoided.

The other structure, operation and effect are the same as those of the first embodiment. Thus, their description will be omitted.

[3] A third embodiment will be described.

The CPU **21** of the power management server **20** has following (41), (42) and (43) as main functions.

(41) Integral power consumption Qs of the office is detected by integrating the detection result Po of the power detection unit **31** for a specific period, for example, in units of one month or in units of one year.

(42) A judgment section that judges whether or not the detected integral power consumption Qo is a previously determined upper limit value Qa or more, and judges whether or not the detected integral power consumption Qo is less than a specified value (=Qa−ΔQ) lower than the upper limit value Qa by ΔQ. The upper limit value Qa is stored in the memory **22**.

(43) An instruction section that instructs each of the image forming apparatuses **1** to reduce power in a case where the judgment result is the upper limit value Qa or more, and instructs each of the image forming apparatuses **1** to cancel the reduction in a case where the judgment result is less than the specified value (=Qa−ΔQ).

The operation will be described.

The operation of the power detection unit **31** and the power management server **20** is shown in a flowchart of FIG. **7**.

The power consumption P of the office is detected by the power detection unit **31** (YES at step **401**). This detection result is supplied to the power management server **20**.

In the power management server **20**, the detected power consumption P is integrated in units of one month or in units of one year, and the integral power consumption Qo of the office is detected (step **402**).

Then, it is judged whether or not the detected integral power consumption Qo is the upper limit value Qa or more (step **403**), and it is judged whether or not the detected integral power consumption Qo is less than a specified value (=Qa−ΔQ) (step **404**).

In the case where the integral power consumption Qo is the upper limit value Qa or more (YES at step **403**), each of the image forming apparatuses **1** is instructed to reduce the power (step **405**). In the case where the integral power consumption Qo is less than the specified value (=Qa−ΔQ) (YES at step **404**), each of the image forming apparatuses **1** is instructed to cancel the reduction (step **406**).

The other structure, operation and effect are the same as those of the first embodiment or the second embodiment. Thus, their description will be omitted.

Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.

What is claimed is:

1. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

a power detection unit that detects one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

a power management server that reduces power consumption of the image forming apparatus in a case where a detection result of the power detection unit reaches a previously determined upper limit value,

wherein the power management server includes:

a judgment section that judges whether the detection result of the power detection unit is the upper limit value or more; and

an instruction section that instructs the image forming apparatus to reduce the power in a case where the judgment result of the judgment section is the upper limit value or more; and

the image forming apparatus includes:

a first control section that changes the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time; and

a second control section that changes the operation mode from the normal power mode to the power saving mode in a case where a reduction instruction is received from the instruction section.

2. The system according to claim **1**, wherein

the image forming apparatus is network-connected to the power management server.

3. The system according to claim **1**, wherein

the second control section continues, in case the image forming apparatus is performing an operation at a time when the reduction instruction is received from the instruction section, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

4. The system according to claim **1**, further comprising

the image forming apparatus includes an auxiliary power supply capable of charging/discharging.

5. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has a function to perform plural jobs and has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

a power detection unit that detects one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

a power management server that reduces power consumption of the image forming apparatus in a case where a detection result of the power detection unit reaches a previously determined upper limit value, wherein the power management server includes:

a judgment section that judges whether the detection result of the power detection unit is the upper limit value or more; and

an instruction section that instructs the image forming apparatus to reduce the power in a case where the judgment result of the judgment section is the upper limit value or more; and

the image forming apparatus includes:

a first control section that changes the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time;

a second control section that changes the operation mode from the normal power mode to the power saving mode in a case where a reduction instruction is received from the instruction section;

a flag that sets inhibition of the job;

a third control section that inhibits, when inhibition is set by the flag at a time of occurrence of the job, execution of the job and notifies the inhibition by a display; and

a fourth control section that suggests, when the inhibition is not set by the flag at the time of occurrence of the job, cancellation or postponement of the job.

6. The system according to claim **5**, wherein

the second control section continues, in case the image forming apparatus is performing an operation at a time when the reduction instruction is received from the instruction section, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

7. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has a function to perform plural jobs, and has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

a power detection unit that detects one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

a power management server that reduces power consumption of the image forming apparatus in a case where a detection result of the power detection unit reaches a previously determined upper limit value, wherein the power management server includes:

a judgment section that judges whether the detection result of the power detection unit is the upper limit value or more, and judges whether the detection result of the power detection unit is less than a specified value lower than the upper limit value; and

an instruction section that instructs the image forming apparatus to reduce the power in a case where the judgment result of the judgment section is the upper limit value or more, and instructs the image forming apparatus to cancel the reduction in a case where the judgment result of the judgment section is less than the specified value, and

the image forming apparatus includes:

a first control section that changes the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time;

a second control section that changes the operation mode from the normal power mode to the power saving mode in a case where a reduction instruction is received from the instruction section;

a flag that sets inhibition of the job;

a third control section that inhibits, when inhibition is set by the flag at a time of occurrence of the job, execution of the job and notifies the inhibition by a display, and cancels the inhibition in a case where a cancellation instruction is received from the instruction section; and

a fourth control section that suggests, when the inhibition is not set by the flag at the time of occurrence of the job, cancellation or postponement of the job by a display.

8. The system according to claim **7**, wherein

the second control section continues, in case the image forming apparatus is performing an operation at the time when the instruction of the instruction section is received, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

9. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption, and a power saving mode in which standby is performed at a power lower than the normal power consumption;

a power detection unit that detects one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

a power management server that reduces power consumption of the image forming apparatus in a case where a detection result of the power detection unit reaches a previously determined upper limit value, wherein the power management server includes:

a judgment section that judges whether the detection result of the power detection unit is the upper limit value or more; and

an instruction section that instructs the image forming apparatus to reduce the power in a case where the judgment result of the judgment section is the upper limit value or more, and

the image forming apparatus includes:

a first control section that changes the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time; and

a second control section that changes the set time to a time shorter than a normal one in a case where a reduction instruction is received from the instruction section.

10. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

power detection means for detecting one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

power management means for reducing power consumption of the image forming apparatus in a case where a detection result of the power detection means reaches a previously determined upper limit value, wherein the power management means includes:

judgment means for judging whether the detection result of the power detection unit is the upper limit value or more, and

instruction means for instructing the image forming apparatus to reduce the power in a case where the judgment result of the judgment means is the upper limit value or more; and

wherein the image forming apparatus includes:

first control means for changing the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time; and

second control means for changing the operation mode from the normal power mode to the power saving mode in a case where a reduction instruction is received from the instruction means.

11. The system according to claim **10**, wherein

the image forming apparatus is network-connected to the power management means.

12. The system according to claim **10** wherein

the second control means continues, in case the image forming apparatus is performing an operation at a time when the reduction instruction is received from the instruction means, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

13. The system according to claim **10**, further comprising

the image forming apparatus includes an auxiliary power supply capable of charging/discharging.

14. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has a function to perform plural jobs and has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

power detection means for detecting one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

power management means for reducing power consumption of the image forming apparatus in a case where a detection result of the power detection means reaches a previously determined upper limit value, wherein the power management means includes:

judgment means for judging whether the detection result of the power detection unit is the upper limit value or more; and

instruction means for instructing the image forming apparatus to reduce the power in a case where the judgment result of the judgment means is the upper limit value or more, and

the image forming apparatus includes:

first control means for changing the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time;

second control means for changing the operation mode from the normal power mode to the power saving

mode in a case where a reduction instruction is received from the instruction means;

a flag for setting inhibition of the job;

third control means for inhibiting, when inhibition is set by the flag at a time of occurrence of the job, execution of the job and notifies the inhibition by a display; and

fourth control means for suggesting, when the inhibition is not set by the flag at the time of occurrence of the job, cancellation or postponement of the job.

15. The system according to claim **14**, wherein

the second control means continues, in case the image forming apparatus is performing an operation at a time when the reduction instruction is received from the instruction means, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

16. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has a function to perform plural jobs, and has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption and a power saving mode in which standby is performed at a power lower than the normal power consumption;

power detection means for detecting one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

power management means for reducing power consumption of the image forming apparatus in a case where a detection result of the power detection means reaches a previously determined upper limit value, wherein the power management means includes:

judgment means for judging whether the detection result of the power detection means is the upper limit value or more, and judges whether the detection result of the power detection means is less than a specified value lower than the upper limit value; and

instruction means for instructing the image forming apparatus to reduce the power in a case where the judgment result of the judgment means is the upper limit value or more, and instructing the image forming apparatus to cancel the reduction in a case where the judgment result of the judgment means is less than the specified value, and

the image forming apparatus includes:

first control means for changing the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time;

second control means for changing the operation mode from the normal power mode to the power saving mode in a case where a reduction instruction is received from the instruction means;

a flag for setting inhibition of the job;

third control means for inhibiting, when inhibition is set by the flag at a time of occurrence of the job, execution of the job and notifying the inhibition by a display, and canceling the inhibition in a case where a cancellation instruction is received from the instruction section; and

fourth control means for suggesting, when the inhibition is not set by the flag at the time of occurrence of the job, cancellation or postponement of the job by a display.

17. The system according to claim **16**, wherein

the second control means continues, in case the image forming apparatus is performing an operation at a time when the instruction of the instruction means is received, the operation, and changes the operation mode from the normal power operation mode to the power saving standby mode after the operation is ended.

18. An electric-power management system comprising:

at least one image forming apparatus, wherein the image forming apparatus has, as an operation mode, a normal power mode in which operation is performed at a normal power consumption, and a power saving mode in which standby is performed at a power lower than the normal power consumption;

power detection means for detecting one of power consumption and integral power consumption of a building where the image forming apparatus is installed; and

power management means for reducing power consumption of the image forming apparatus in a case where a detection result of the power detection means reaches a previously determined upper limit value, wherein the power management means includes:

judgment means for judging whether the detection result of the power detection means is the upper limit value or more; and

instruction means for instructing the image forming apparatus to reduce the power in a case where the judgment result of the judgment means is the upper limit value or more, and

the image forming apparatus includes:

first control means for changing the operation mode from the normal power mode to the power saving mode in a case where a time of the standby reaches a previously determined set time; and

second control means for changing the set time to a time shorter than a normal one in a case where a reduction instruction is received from the instruction means.

* * * * *